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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/901,988	07/10/2001	Clive Tang	59864.00660	7923
32294	7590	10/10/2007		
SQUIRE, SANDERS & DEMPSEY L.L.P. 14TH FLOOR 8000 TOWERS CRESCENT TYSONS CORNER, VA 22182			EXAMINER GHEBRETINSAE, TEMESGHEN	
			ART UNIT 2611	PAPER NUMBER
			MAIL DATE 10/10/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

87

Office Action Summary	Application No.		Applicant(s)	
	09/901,988		TANG, CLIVE	
	Examiner		Art Unit	
	Temesghen Ghebretinsae		2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14, 15 and 21 is/are allowed.
- 6) ☒ Claim(s) 1-12, 16-18, 22 and 23 is/are rejected.
- 7) ☐ Claim(s) 13, 19 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. It would be of great assistance to the Office if all incoming papers pertaining to a filed application carried the following items:

1. Application number (checked for accuracy, including series code and serial no.).
2. Group art unit number (copied from most recent Office communication).
3. Filing date.
4. Name of the examiner who prepared the most recent Office action.
5. Title of invention.
6. Confirmation number (See MPEP § 503)

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “**changing means**” and **means for selectably changing**” of claim 22 and “**changing unit configured to change...**” and “ **changing unit configured selectably changing...**” of claim 23 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

Art Unit: 2611

consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-13,16-18,22-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshida (6,452,964).

Consider claims 113,16-18,22-23. Yoshida discloses an apparatus comprising:
a calculator or selector (105) coupled to receive indications of a selected communication indicia (CNR and average received power) associated with communication characteristic of a communication channel during selected interval;

See Yoshida col.6, lines 7-12.

"A modulation level decision unit 105 of the transmitter 101 in station A decides the modulation level ML of a signal to be transmitted, based on both an average received power .gamma..sub.r reported from a received power measurement

Art Unit: 2611

unit 109 of a receiver 103 in station A and a threshold CNR γ_{ML} at each modulation level ML, and reports it to a data selector 106 of the transmitter 101 in station A."

the calculator being configured to select the at least first switched threshold, the first switched threshold changeable responsive to changes in the selected communion indicia, and the first switched threshold selected by the calculator to at least satisfy a first performance criteria and to satisfy at least a second performance criteria; see Yoshida col.7, line 59 to col.8, line 28.

*"FIG. 3 shows an example of threshold CNR vs BER performances at each modulation level ML in the preferred embodiment of the present invention. As seen from FIG. 3, when a BER is fixed to an arbitrary target BER, a ratio of average CNRs between modulation methods, that is, a QPSK (ML=2), a 16QAM (ML=4) and a 64QAM (ML=6) becomes $\frac{\Delta}{\sigma^2 N} \text{ vs } 5 \frac{\Delta}{\sigma^2 N} \text{ vs } 21 \frac{\Delta}{\sigma^2 N} \approx 0.048 \text{ vs } 0.24 \text{ vs } 1$. Therefore, in order to maintain the BER of the channel larger than the target BER, first, for example, in a 64QAM modulation method the absolute value γ of an average CNR γ_{64QAM} such that the BER equals the target BER, is calculated, and this absolute value γ is designated to be the threshold of an averaged CNR for switching over a 64QAM modulation method and a 16QAM modulation method (threshold CNR γ_{64QAM}). Then, an absolute value 0.24γ obtained by multiplying the switching CNR $\gamma_{64QAM} = \gamma$ by 0.24 is designated to be the threshold of an average CNR for switching over a 16QAM modulation method and a QPSK modulation method (threshold CNR γ_{16QAM}). Furthermore, an absolute value 0.048γ obtained by multiplying the switching CNR $\gamma_{64QAM} = \gamma$ by 0.048 is designated to be the threshold of an average CNR for switching over a QPSK modulation method and a transmission-off mode (threshold CNR γ_{QPSK}) **For example, by using three threshold CNRS γ , 0.24γ and 0.048γ obtained in this way, the following control is implemented at transmission. First, an average CNR at a receiver is observed. Then, if the observed average CNR is higher than γ , a transmission by a 64QAM modulation method is employed. If the observed average CNR is between threshold CNRs 0.24γ and γ , a transmission by a 16QAM modulation method is employed. If the observed average CNR is between threshold CNRs 0.048γ and 0.24γ , a transmission by a QPSK modulation method is employed. If the observed average CNR is lower than a threshold CNR***

Art Unit: 2611

0.048.gamma., a transmission is turned off, according to the system regulations, or a transmission by a QPSK modulation method is employed."

5. As per claim 3 and 4, the communication Indicia comprises error indicia representative of error introduced upon the data during communication upon the communication channel

See Yoshida col.4, line 42-57.

First, the squared error of the minimum value of distances between each of the signal points to be received at the modulation level ML and the signal point of a received signal is calculated at each modulation level ML.

The receiving power level of the received signal is measured.

Then, a value obtained by multiplying the squared error calculated at each modulation level ML by a weight calculated from both a threshold for switching a modulation level ML and the received power level, is calculated as a likelihood value at each modulation level ML.

The average throughput of the received signal is measured.

Then, each of thresholds for switching the modulation levels MLs is changed based on the average throughput.

6. As per claims 5-6; the data transmitted by the first communication (101) is transmitted to as second communication station (103), wherein the second communication station is coupled in a feedback arrangement with the first communication to return to the first communication station a report representative of the communication characteristic of the communication channel (see fig.2) The data transmitted by the first communication station is formatted into a plurality of data frames; the first switched threshold selected by the calculator (105) is selected, and the

Art Unit: 2611

modulation parameter selected therefrom is selected, prior to transmission of subsequent data frame by the first communication station

See Yoshida col.6, line 58 to col.7, line 6.

The transmitter 101 in station B generates a signal to be transmitted to station A using the same operation that the transmitter 101 in station A uses, and transmits it to a correlation channel. At this time, the modulation level decision unit 105 of the transmitter 101 in station B determines the modulation level ML of the transmission signal, based on both an average received power $\gamma_{sub,r}$ inputted from the received power measurement unit 109 of the receiver 103 in station B and a threshold CNR $\gamma_{sub,ML}$ at each of the modulation levels MLs.

The receiver 103 in station A decodes the received signal used the same operation that the receiver 103 in station B uses. At this time, the received power measurement unit 109 of the receiver 103 in station A reports the average received power $\gamma_{sub,r}$ measured for the received signal to the modulation level decision unit 105 of the transmitter 101 in station A.

7. As per claims 7-8, the selected communication indicia to which the calculator is coupled to receive indications thereof comprises throughput indicia and error rate indication

See Yoshida col.4, line 42-57.

First, the squared error of the minimum value of distances between each of the signal points to be received at the modulation level ML and the signal point of a received signal is calculated at each modulation level ML.

The receiving power level of the received signal is measured.

Then, a value obtained by multiplying the squared error calculated at each modulation level ML by a weight calculated from both a threshold for switching a modulation level ML and the received power level, is calculated as a likelihood value at each modulation level ML.

The average throughput of the received signal is measured.

Then, each of thresholds for switching the modulation levels MLs is changed based on the average throughput.

Art Unit: 2611

8. As per claims 9-11, the apparatus further comprises a modulator parameter selector (104,106) coupled to the calculator (105); wherein the modulation parameter comprise a modulation type by which the data is modulated by the first communications station; and the modulation parameter comprises an encoding rate.

See Yoshida col.6, lines 14-19.

The data selector 106 of the transmitter 101 in station A selects a modulation signal among modulation signals at each of the modulation levels MLs outputted from the adaptive modulator/encoder 104 which corresponding to the modulation level ML reported from the modulation level decision unit 105, and transmits it to a correlation channel 102 as a transmitted signal for station B.

9. As per claim 16-18,22-23, Yoshida discloses selecting at least a first switching threshold responsive to indications of selected communication indicia associated with communication characteristics of the communication channel;

See Yoshida col.8, lines 15-28.

For example, by using three threshold CNRS γ , 0.24γ and 0.048γ obtained in this way, the following control is implemented at transmission. First, an average CNR at a receiver is observed. Then, if the observed average CNR is higher than γ , a transmission by a 64QAM modulation method is employed. If the observed average CNR is between threshold CNRs 0.24γ and γ , a transmission by a 16QAM modulation method is employed. If the observed average CNR is between threshold CNRs 0.048γ and 0.24γ , a transmission by a QPSK modulation method is employed. If the observed average CNR is lower than a threshold CNR 0.048γ , a transmission is turned off, according to the system regulations, or a transmission by a QPSK modulation method is employed.

Selecting the modulation parameters by which the data is operated upon by the first communication station prior to transmission upon the communication channel;

See Yoshida col.6, lines 7-19.

Art Unit: 2611

A modulation level decision unit 105 of the transmitter 101 in station A decides the modulation level ML of a signal to be transmitted, based on both an average received power γ_r reported from a received power measurement unit 109 of a receiver 103 in station A and a threshold CNR γ_{ML} at each modulation level ML, and reports it to a data selector 106 of the transmitter 101 in station A.

The data selector 106 of the transmitter 101 in station A selects a modulation signal among modulation signals at each of the modulation levels MLs outputted from the adaptive modulator/encoder 104 which corresponding to the modulation level ML reported from the modulation level decision unit 105, and transmits it to a correlation channel 102 as a transmitted signal for station B.

Changing the at least the first switching threshold responsive to change in the indications of selected communication indicia

For example, by using three threshold CNRS γ , 0.24γ and 0.048γ obtained in this way, the following control is implemented at transmission. First, an average CNR at a receiver is observed. Then, if the observed average CNR is higher than γ , a transmission by a 64QAM modulation method is employed. If the observed average CNR is between threshold CNRs 0.24γ and γ , a transmission by a 16QAM modulation method is employed. If the observed average CNR is between threshold CNRs 0.048γ and 0.24γ , a transmission by a QPSK modulation method is employed. If the observed average CNR is lower than a threshold CNR 0.048γ , a transmission is turned off, according to the system regulations, or a transmission by a QPSK modulation method is employed.

Selectably changing the modulation parameter responsive to changes in the at least the first switching threshold

A modulation level decision unit 105 of the transmitter 101 in station A decides the modulation level ML of a signal to be transmitted, based on both an average received power γ_r reported from a received power measurement unit 109 of a receiver 103 in station A and a threshold CNR γ_{ML} at each modulation level ML, and reports it to a data selector 106 of the transmitter 101 in station A.

The data selector 106 of the transmitter 101 in station A selects a modulation signal among modulation signals at each of the modulation levels MLs outputted from the

Art Unit: 2611

adaptive modulator/encoder 104 which corresponding to the modulation level ML reported from the modulation level decision unit 105, and transmits it to a correlation channel 102 as a transmitted signal for station B.

Yoshida also discloses performing selecting the at least first switching threshold by executing an algorithm as claimed in claim 18.

For example, by using three threshold CNRS γ , 0.24γ and 0.048γ obtained in this way, the following control is implemented at transmission. First, an average CNR at a receiver is observed. Then, if the observed average CNR is higher than γ , a transmission by a 64QAM modulation method is employed. If the observed average CNR is between threshold CNRs 0.24γ and γ , a transmission by a 16QAM modulation method is employed. If the observed average CNR is between threshold CNRs 0.048γ and 0.24γ , a transmission by a QPSK modulation method is employed. If the observed average CNR is lower than a threshold CNR 0.048γ , a transmission is turned off, according to the system regulations, or a transmission by a QPSK modulation method is employed.

Allowable Subject Matter

10. Claims 13,19-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Claims 21,14-15 are allowed.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Temesghen Ghebretinsae whose telephone number is 571-272-3017. The examiner can normally be reached on Monday-Friday from 8 to 6. The examiner can also be reached on alternate .

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ghayour Mohammed, can be reached on 571-272-3021. The fax phone

Art Unit: 2611

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Temesghen Ghebretinsae
Primary Examiner
Art Unit 2611

T.Ghebretinsae

9/20/07

TEMESGHEN GHEBRETINSAE
PRIMARY EXAMINER
9/20/07